213 Problem Set 14 Solutions

This is it!

5.3.29. The only thing tricky here is that you probably want to distribute first. So, before we even get into integration, let's do that $(t+2)(t-3) = t^2 - t - 6$. So, now $\int_{-2}^{3}(t+2)(t-3)dt = \int_{-2}^{3} t^2 - t - 6dt = \left[\frac{1}{3}t^3 - \frac{1}{2}t^2 - 6t\right|_{-2}^{3} = [\frac{1}{3}3^3 - \frac{1}{2}3^2 - 6(3)] - [\frac{1}{3}(-2)^3 - \frac{1}{2}(-2)^2 - 6(-2)] = -\frac{125}{6}$. Note this is negative because the graph is below the axis exactly in this range.

5.3.35. This one is probably even more direct than the other. $\int_1^2 \frac{2}{x^3}dx = \int_1^2 2x^{-3}dx = \left[-x^{-2}\right|_1^2 = -\frac{1}{2^2} - (-\frac{1}{1^2}) = \frac{3}{4}$. Yep, that was more direct.